HOW TO MAKE AN IMPLEMENT HITCH FOR YOUR "CATERPILLAR" DIESEL TRACTOR

ALTHOUGH Caterpillar Tractor Co. no longer manufactures implement hitches, many inquiries are received concerning their construction. As a service to agriculture this booklet has been prepared, and is made available to you by the man who sells and services "Caterpillar" Diesel power, your Dealer.

General Principles of Hitches

Explanation

In order to understand the reason for certain hitch adjustments, it will be necessary to explain some of the basic principles underlying hitching a "Caterpillar" Tractor to an implement.

The HITCH, in the sense the term is used in this book, is the connection between the "Caterpillar" Tractor and the implement it pulls. The hitch begins where flexibility begins in the rear of the tractor, and ends where flexibility ends in solid attachment to the implement.

The HITCH, which may be constructed of a chain, set of chains, cable, wood or iron bars, bolt or pin, is usually considered as a part of the implement.

"Center of Resistance"

Every implement has ONE POINT where, if a single chain were attached to that point, the implement could be pulled straight ahead. This point is called the "center of resistance."

On nearly all seedbed-preparation or planting tools, such as disk harrows, drills, drags, etc., this point can, for all practical purposes, be considered in the center of the working width.

This is assuming that both sides of the implements are set to work the same depth, and meet the same resistance from the soil. (If, however, the tool is set to cut deeper on one side, or meets uneven soil resistance, the center of resistance will not be at the center, but off to one side.)

Such implements, however, are usually built so that there is only one hitch point when looking at the implement from the top. That hitch point is in the center.

Wherever the width of land worked is equal to or greater than the width of the "Caterpillar" Tractor, such implements should be hitched directly behind the center of the drawbar.

FIGURE I

Center of Resistance of Plow

A moldboard plow DOES NOT have its center of resistance in the center of the land worked. The center of resistance varies with the type of plow and the character of the soil. The most commonly used plow, however, is the 14" general purpose moldboard plow. The center of resistance in this type of plow, cutting a furrow slice 14" wide and 7" deep, has been found to be approximately at a point on the surface of the moldboard 3" from the landslide, 3" above the bottom level, and about 14" back from the share point. For other widths of bottoms and depths of cutting, the center of resistance is in about the same relative position.

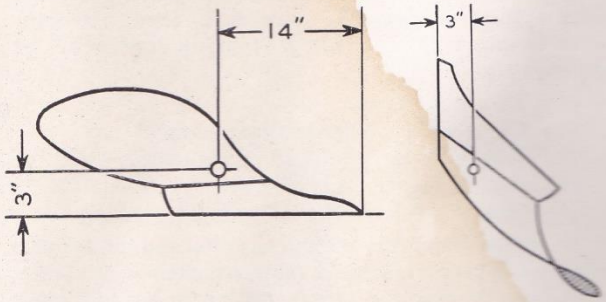


FIGURE II. *The circle shows the location of the center of resistance of a 14" moldboard plow when plowing 7" deep. Side view on the left and top view on the right.*

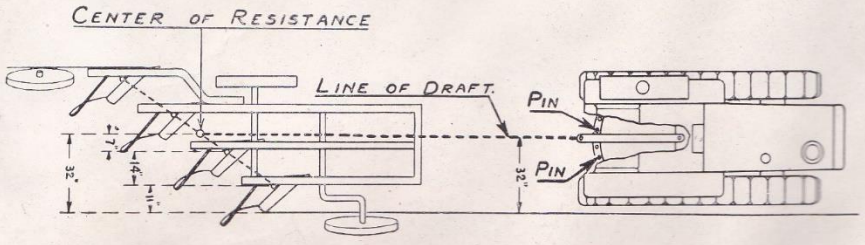
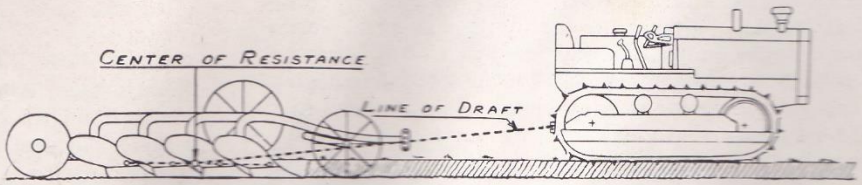


FIGURE III. *Top view of "line of draft" of a 4-bottom plow.*

FIGURE IV. *Side view of "line of draft" of a 4-bottom plow.*



Draft

The draft of any tractor-operated implement is the resistance of the implement to forward motion—that is, if a tractor had to exert a pull of 2,000 pounds on the drawbar to move a 3-bottom plow at a given speed it could be stated that the draft of the plow was 2,000 pounds.

Line of Draft

The "line of draft" is an imaginary line running from the part of the tractor drawbar where flexibility starts to the "center of resistance" of the implement drawn. On account of the variation in the location of the center of resistance in various implements, the line of draft is considered from two points of view—one from the top of the tractor, and the other from the side.

Pinned and Swinging Drawbars

Tractor drawbars are provided with pins which may be removed, thus allowing the drawbar to swing sideways lining up with the draft, or they may be pinned in any position. A good general rule to follow is to ALLOW A DRAWBAR TO SWING WHENEVER POSSIBLE to satisfactorily handle a load. The effect of a pinned or swinging drawbar is most noticeable when turning with the load. A swinging drawbar allows the tractor to—

(1) Turn more easily.
(2) Use steering brakes less frequently.
(3) Turn with less effort of outside track.
(4) Handle bigger loads on turns.
(5) Handle a side-draft load with less steering.

When the drawbar is allowed to swing and the drawbar pivot pin is properly located (approximately in the center of the area between the tracks), the tractor can turn much more easily with a load than it can with the drawbar pinned.

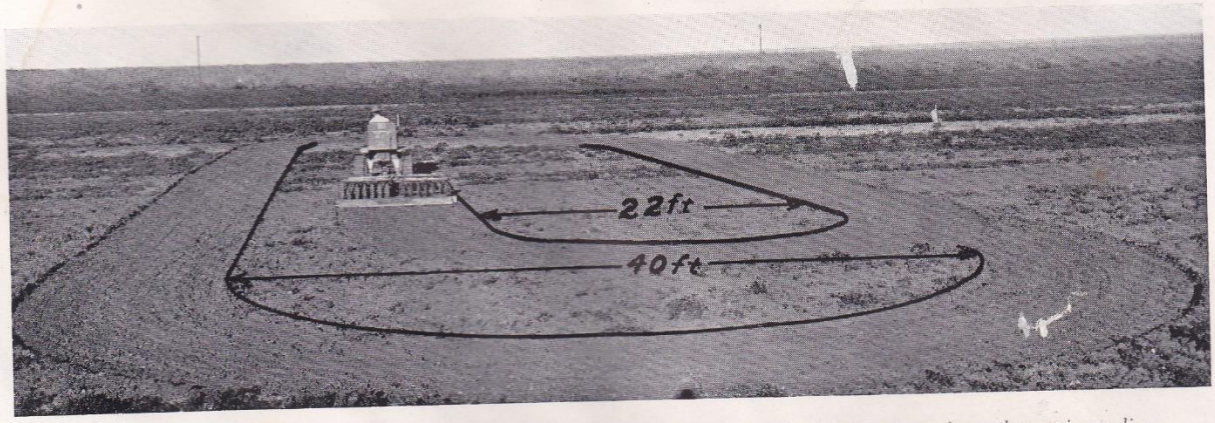


FIGURE V. *Showing the effect of pinned and swinging drawbars. A swinging drawbar reduces the turning radius required almost one half.*

In Figure V is shown an example of this. A tractor is hitched to a double disk. When the steering clutch was released (without the use of the foot brake) with the drawbar pinned, the unit required a 40 ft. diameter (inside) in which to turn. With the drawbar swinging and again only the steering clutch used, it turned in a 22 ft. diameter (inside) with the same load.

With some implements such as plows and harvesting machines, it is possible to allow the drawbar to swing a few inches, thus preventing the load from getting too much to one side, but yet materially helping in steering a straight course. Note position of drawbar pins in Figure III.

Lengthening Hitch

Side draft may be materially decreased by lengthening the hitch. The side draft decreases as the ANGLE OF PULL decreases.

In the accompanying illustration (Figure VII) load "A" is offset about 25" to the right of the center line of the tractor, and the load is close to the tractor, causing considerable side draft. The side draft is decreased over one-half by doubling the length of the hitch, so that the load trails the tractor at "B." Note angle "b" when the tractor is attached to load "A," and angle "a" when attached to load "B." The difference in the angles can be seen by the shaded portion of angle "b." This shaded portion represents the reduced angle of hitch caused by lengthening the hitch.

In some types of plows, and in other implements where side draft is unavoidable, this principle is well worth remembering.

If the hitch is lower on the drawbar than the load, there is a tendency to pull the load into the ground. A long hitch also decreases this tendency.

Horizontal and Vertical Adjustments

In hitching to any pulled type implement, it must be remembered that the hitch must be considered from two angles—first, as viewed from the top, and second, as viewed from the side. Any adjustments made to get the hitch correct from the top view are called horizontal adjustments, and any made when considered from the side view are called vertical adjustments.

Plow Hitches

The most common form of tractor plow hitch is what is known as the "A" frame hitch. In hitching the "Caterpillar" Tractor to a plow equipped with this kind of hitch, there is one general rule to apply when considering the hitch from the top. That is, both members of the "A" frame hitch should be in tension (pulling) when the tractor is pulling.

Horizontal Adjustment

To secure both members in tension, first determine the center of resistance of the plow. Second, back the tractor in front of the plow in such a position that the right track edge is a little to the left of the right cutting edge (tip of the wing) of the front plow. This will place the tractor so that on the second round the right track will be a short distance to the left of the furrow wall.

Next, draw an imaginary line from the hitch point on the tractor to the center of resistance of the plow. Then adjust the "A" frame hitch so that its left member is either in this imaginary line, or a little to the left. The right member should be to the right of this line.

When the width of the plow exceeds the width of the tractor, the center line of the tractor should be directly in front of the center of resistance of the plow as in Fig. VI. As an illustration of this a 56" gauge Diesel D6 with 16-inch shoes would be 8 inches from the furrow wall when hitched to a five bottom 16-inch gang plow.

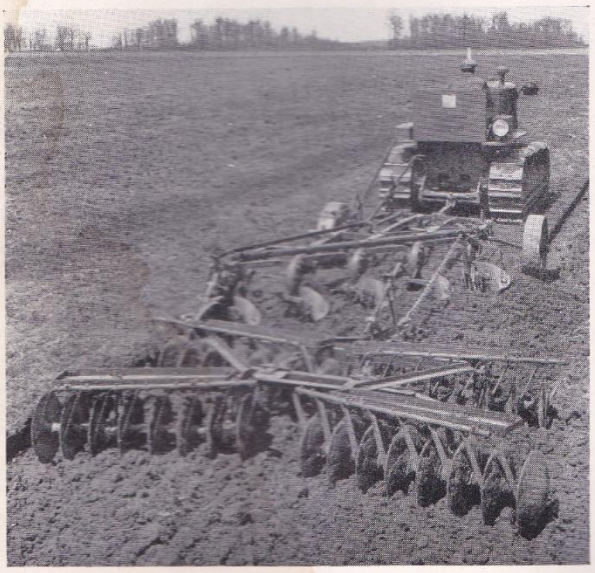


FIGURE VI. *A plow and disk properly hitched back of a Diesel Tractor. The center line of the tractor is directly in front of the center line of the plow and disk.*

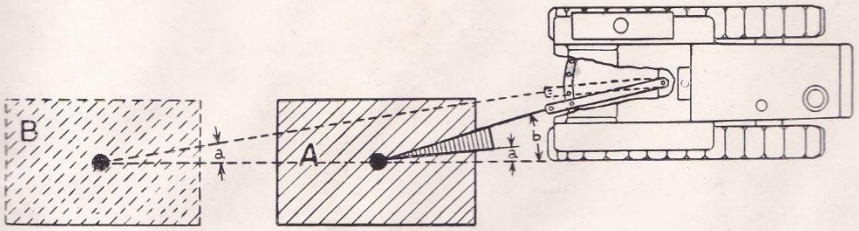
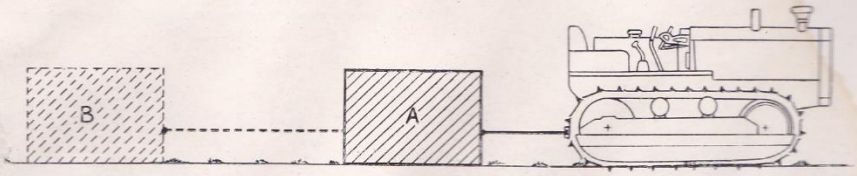


FIGURE VII. *Increasing the length of hitch reduces the angle of pull and the amount of side draft.*

FIGURE VIII. *The hitch is level and the load "A" is close to the tractor. Suppose a long cable is placed between the tractor and the load. The load, then, is at "B", but the angle of pull is not changed. The tractor can move the load at "B" just as easy as at "A".*



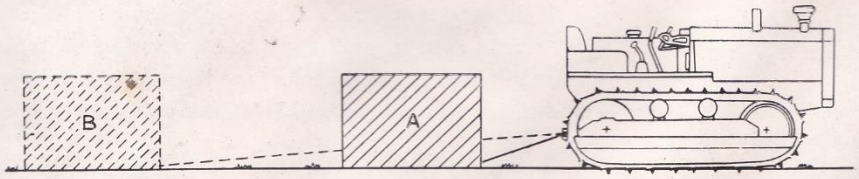


FIGURE IX. *When the tractor drawbar hitch is higher than the hitch on the load, there is a tendency to lift the load. A long hitch reduces this tendency.*

Vertical Adjustment

After the hitch has been adjusted horizontally, the next adjustment is for height. It is a good general rule to follow to keep the hitch as low as possible on the tractor. This allows the tractor to secure better footing and to more efficiently utilize its power. However, the point of attachment to the implement should never be higher than the hitch point on the tractor. The line of draft should, if possible, pass through the hitch point on the implement. Where the implement is a tillage or other earth working tool, this point is always below the point of attachment of the hitch to the tractor. Figure IV, shows the correct vertical hitch adjustment for a plow. This is the point on the vertical hitch of the plow where it is intersected by the line of draft. Where the hitch is connected high on the plow there is excessive weight placed on the front wheels, causing increased draft and rapid bearing wear. There would also be a tendency to run the front end of the plow deeper than the rear, causing a rough furrow. On the other hand, attaching the hitch too low on the plow would tend to lift the wheels off the ground giving insufficient traction to operate the power lift and in hard soils poor penetration may also result.

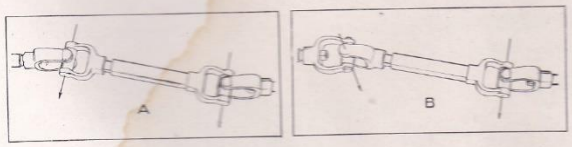
When hitching to combine harvesters or other machines with front wheels or tongue trucks immediately

behind the hitch attachment, a hitch point on the implement pulled which is materially higher than the hitch point on the tractor will result in pulling the front wheels into the ground, thus increasing the draft and decreasing the amount that the tractor can pull, since the hitch tends to lift the back of the tractor off the ground.

Cautions When Connecting Universal Joints

When hitching the tractor to this type of machine it is desirable that the spline shaft on the power take-off of the tractor and the spline shaft on the implement should be as near as possible the same distance above the ground—that is, provide a level drive. The connection on the implement should be directly behind the connection to the tractor. In this way, a minimum of angle will be thrown into the universal joints thus reducing wear and producing a more even flow of power.

To insure smooth operation of the driven mechanism, it is essential to so connect the slip joint that the two forks of the universals on either side and next to the slip joint are parallel and not at right angles.



RIGHT WRONG

FIGURE X. *The right and wrong way to couple the slip joint between universal joints. Note parallel arrows.*

In Figure X, "A" illustrates the proper method to correctly connect the slip joint. Note the arrows are parallel. In "B" the arrows are at right angles, which is wrong and results in jerky or uneven driving motion.

It should be remembered that when operating power take-off driven machines "Caterpillar" Tractors have advantages not found in other tractors.

Power Take-Off Hook-ups

The power take-off is now commonly used to transmit power directly from the tractor engine to the machine being pulled behind, thus taking the place of a ground wheel or separate engine drive. Such machines are mowers, binders, sprayers, windrow bailers, ensilage cutters, corn picker huskers, etc. Power take-off speeds and size of shaft are standardized so that any machine that is designed to be run with a power take-off may be connected to the power take-off shaft of the tractor. Two-wheel type implements seem to work best with power take-off. Such machines are usually supported in part by the tractor or tractor drawbar and have only one pivot point in the hitch. With these machines it is desirable to have this pivot point or hitch pin as near as possible midway between the two universal joints of the power take-off.

MULTIPLE HITCHES

Reasons for Multiple Hitches

With a larger tractor it is generally desirable to pull two or more implements. The reasons for this are:

1. Considerable work can be accomplished by one man because he can handle more implements.
2. Additional implements increase the load when one implement is not a full load. A TRACTOR OPERATES MOST ECONOMICALLY considering the amount of work accomplished WHEN OPERATING NEAR CAPACITY.
3. The implements on the farm can generally be used without the necessity of purchasing new implements.
4. Tractor work on uneven ground conditions is many times handled easier with smaller implements hitched together than with a single large implement.
5. Crop production costs are greatly reduced.
6. Power work is accomplished faster.

General Rules

It is easy to build a "home made" multiple hitch for certain specific implements or for a variety of implements. Certain general rules apply to the construction and use of all multiple hitches. These are:

1. The hitch must be strong enough to transmit the pull of the tractor.
2. It must allow the implements attached to it to turn without interference.
3. It should be so constructed that implements may be quickly attached or detached.
4. If the hitch is wide it should have joints or other provisions for flexibility on uneven ground.
5. Some prefer to mount these hitches on wheels. Where this type of construction is used, it is very important that wheels of ample size and tire width be used so as not to materially increase the draft of the multiple unit.

It is important to attach the hitch member to the axle in such a manner that the pull from the tractor drawbar to the center of resistance of the load does not cause a downward pressure on the wheel.

6. For hitching several drills for use on hilly land it is necessary to either provide stiff cross connecting bars or rigid brace and connection. This prevents the drills from running ahead and holds them in place on the hillsides.
7. It should be easily adapted to different kinds of implements.
8. It should be so constructed that it may be quickly dismantled for transportation when necessary to move along roads, over bridges and through gates.

Construction Considerations

Materials for constructing multiple hitches can usually be found about the farm or can be purchased economically from a scrap iron dealer.

Multiple hitches can be made of pipe, angle iron, wood, chain, cable or a combination of these materials. Where wood is used, the various members should be reinforced by a steel plate to strengthen the connections. Welded construction on the main frame where steel members are used is preferable, in which case the length of the members will vary from the dimensions used in bolted construction.

The center of resistance of the pulled implements should be known, to establish the line of draft. This permits the pull member of the hitch to be located in the proper place. It may also alter dimensions of various hitch members.

Length of hitch members should be determined before hitch construction starts.

Drawings of suggested hitch designs are given on the following pages. It is obviously impossible to have a hitch design which would fit all types of implements. Therefore, these drawings should be studied carefully and necessary changes made for local conditions, implements, materials of construction to be used, etc. All necessary calculations should be made before securing or cutting materials for constructing the hitch. If convenient, the hitch may be marked out on the floor with the implements in the proper place, or this may be done in the field.

Important

Before attempting to construct a hitch from the drawings on the pages following, *carefully study the drawings as well as read the notes which accompany and refer to them.* Do not try to scale the drawings for dimensions of various members. Use either the table of materials or calculate the length of members in accordance with instructions given in the accompanying notes.

TWO-COMBINE HITCH

The drawing will serve as a guide in building a two combine hitch. The exact size of parts and lengths of cables will vary with the size and make of combine. The general location of pull cable and guide cable should be approximately as shown. Adjustment of jockey stick and length of cables can be made after trial to cause the second combine to trail correctly.

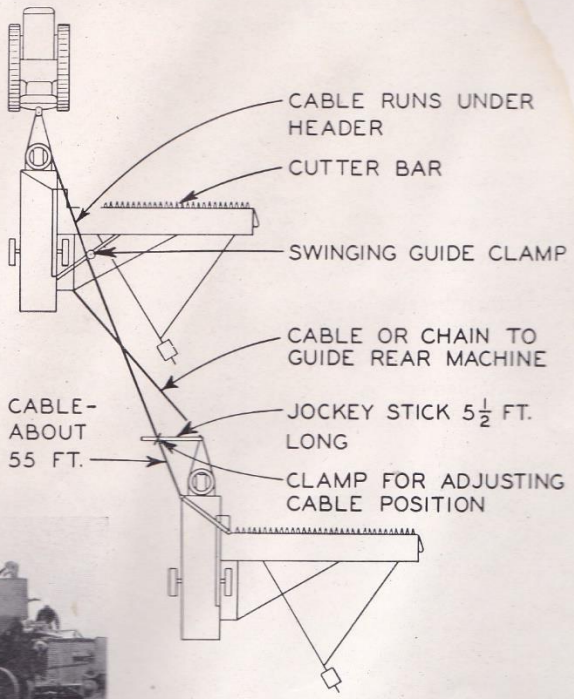

CABLE RUNS UNDER HEADER
CUTTER BAR
SWINGING GUIDE CLAMP
CABLE OR CHAIN TO GUIDE REAR MACHINE
JOCKEY STICK 5½ FT. LONG
CABLE-ABOUT 55 FT.
CLAMP FOR ADJUSTING CABLE POSITION

FIGURE XI

FIGURE XII

Two Plow Hitch

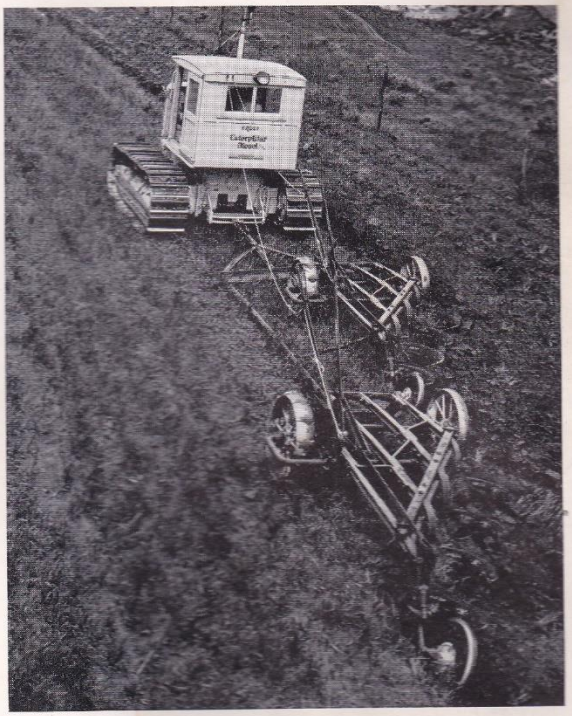


Figure XIII

This drawing of a two plow hitch made by a "Caterpillar" owner is intended only as a guide for building a similar hitch.

The plow with the larger number of bottoms should be used in front and the smaller in the rear.

The center line of resistance of a multiple-bottom plow combination is half way between the center of resistance of the front and rear bottoms of the plow combination. The correct line of hitch is a straight line extending from the center of resistance of the plow combination to the tractor drawbar. The line of hitch should be on the center line of the tractor from front to rear. The location of hitch member "C" is on this line of hitch. Dimensions given on member "C" should be adhered to in order to properly turn tractor without interfering with the main frame of the hitch.

The length of member "E" will vary according to type frame, number of bottoms on each plow, and method of attaching plow to hitch. No exact rule can be given for determining this dimension. It should be long enough however to allow some adjustment of clevises "F".

Clevis "F" may not be adapted to all type plows in which case its construction will have to be altered to meet requirements. Dimensions are not given between clevises marked "F". This distance is governed by the plow frame which will be attached to the clevises.

The length of hitch member "G" will vary according to the length of the front plow. Its length should be such as to permit short turning of the two plows without having the rear plow interfere with the rear furrow wheel of the front plow. The center line of member "G" should be on the center line of draft of the rear plow.

A spacer "K" is needed between member "G" and the rear of the front plow. This spacer and the method of attaching "G" to rear of front plow frame should not only maintain the proper distance between "G" and the rear of the front plow but should permit vertical movement of the rear end of "G" and horizontal movement at the clevis.

Spacer length is determined by size of plows and spacer construction. Spacers are usually made adjustable.

The method of attaching spacer to front gang will vary. A different type bolt than the one shown, a welded piece on the plow frame, a clamp, a support bolted across the top of the plow frame, or other arrangement to meet service requirements may be used.

A cable or rod may be substituted for "J" if desired, or "J" may be omitted entirely.

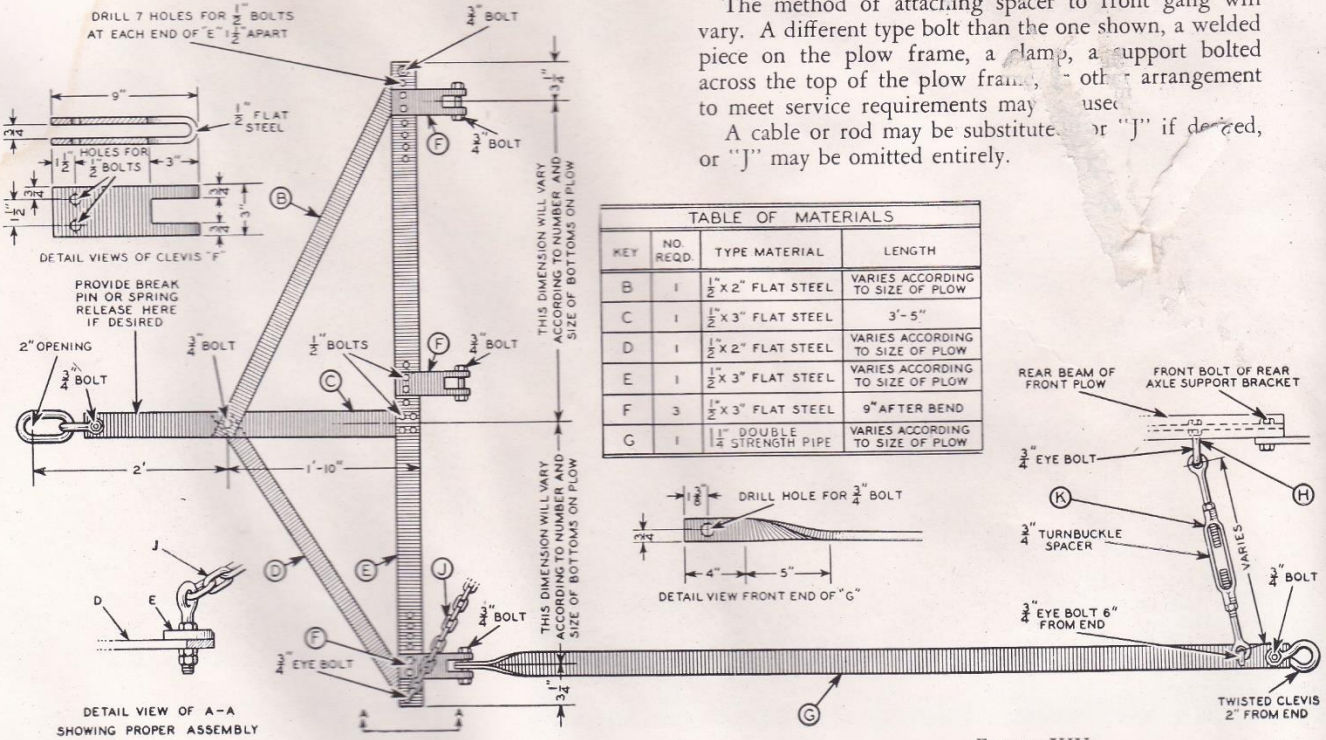
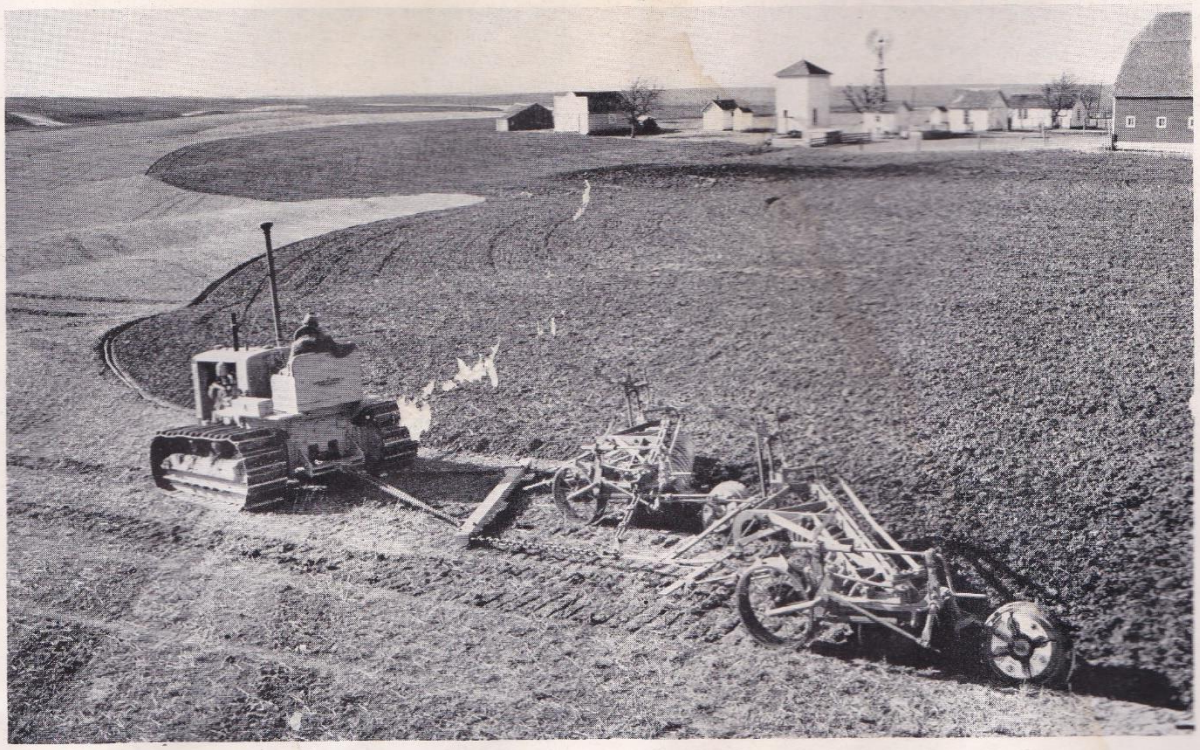


TABLE OF MATERIALS			
KEY	NO. REQD.	TYPE MATERIAL	LENGTH
B	1	1/2" X 2" FLAT STEEL	VARIES ACCORDING TO SIZE OF PLOW
C	1	1/2" X 3" FLAT STEEL	3'-5"
D	1	1/2" X 2" FLAT STEEL	VARIES ACCORDING TO SIZE OF PLOW
E	1	1/2" X 3" FLAT STEEL	VARIES ACCORDING TO SIZE OF PLOW
F	3	1/2" X 3" FLAT STEEL	9" AFTER BEND
G	1	1" DOUBLE EXTRA STRENGTH PIPE	VARIES ACCORDING TO SIZE OF PLOW

Figure XIV

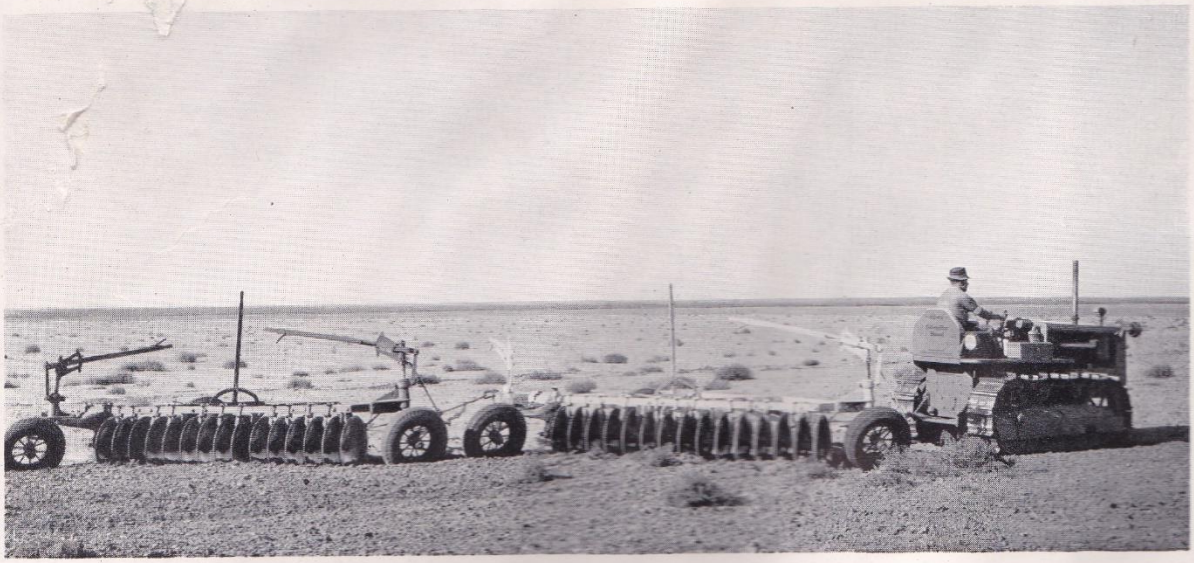
Multiple Hitch for Two One Way Disk Plows



Farm Made Multiple Hitch

Picture above shows construction details of home made hitch for two one way disk plows. Hitch on each plow should be adjusted so that the chain that draws it is parallel to the direction of travel; that it points straight ahead otherwise there will be side draft in the tractor. This hitch may be made of angle iron, wood, chain or cable. If wood is used for the crossbar it should be reinforced by a steel plate to strengthen the connection points.

Picture below shows hitch supplied by plow manufacturer. Note that rear plow is hitched to rear of front plow.



Factory Made Hitch

Two-Implement Hitch

This drawing is intended only as a guide for constructing a two-implement hitch.

If the implements are not the same width, the wide one should be used in front and on the right side of the hitch.

The center line of resistance of a multiple implement combination is generally considered to be in the center of the implement combination. This may vary, however, with implements of equal length and of unequal draft. The correct line of hitch is a straight line extending from the center of resistance of the implement combination to the tractor drawbar. The line of hitch should be on the center line of the tractor from front to rear. The location of hitch member "C" should be on this line of hitch. The dimensions given on member "C" should be adhered to in order to properly turn the tractor without interfering with the main frame of the hitch.

The length of member "E" will vary according to the width of the implements to be used with the hitch. It should be equal to half the width of the implements, plus one foot. This may vary with certain implements having a tongue to one side of the center of the implement such as an offset disk harrow, etc. This length allows for adjustment of implement on the main hitch frame. The dimensions shown in the drawing are for two 10-foot disks of a specific make.

The length of members "B", "D" and "G" will vary as the length of member "E" varies.

Clevises "F" may not be adapted to all types of implements, in which case their construction will have to be altered to meet requirements. Dimensions are not given between clevises. This distance is governed by the working width of the implements and their tongue connections.

The brace indicated by "H" on the drawing should be adjustable and rigid. It is generally attached to the hitch frame at the center part of member "E". Its point of attachment on the implement will vary according to the implement. For example, on disks it will attach to the frame, near the middle of the front gang, but should not interfere with working adjustments of the disk. On a drill it will be attached to the frame, approximately 16 inches from the wheel. Different implements will require a brace of different lengths—hence this brace is shown as adjustable. The dimensions shown and method of construction will meet the needs of practically all types of implements.

The rigid brace prevents "skips" at the end of the field when turning. It also holds the implements in their proper position on down hill and side hill operation.

The rigid tongue assembly consists of two members designated as "K" and "L". These members extend from clevises "F" on the left side of the hitch to the steel plate designated as "J" at the rear of the assembly. Members "K" and "L" are tied together by members "M", "N" and "P". The rigid tongue length will vary according to the length of implements used.

The dimensions shown on the drawing were figured

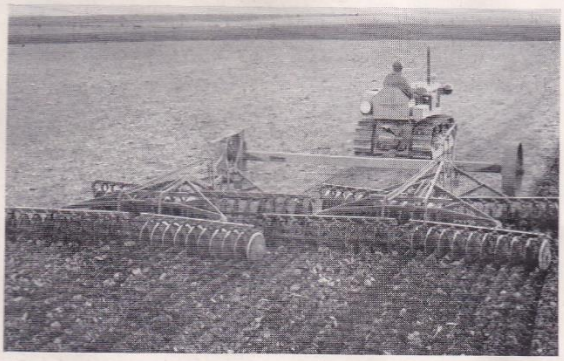


Figure XVI

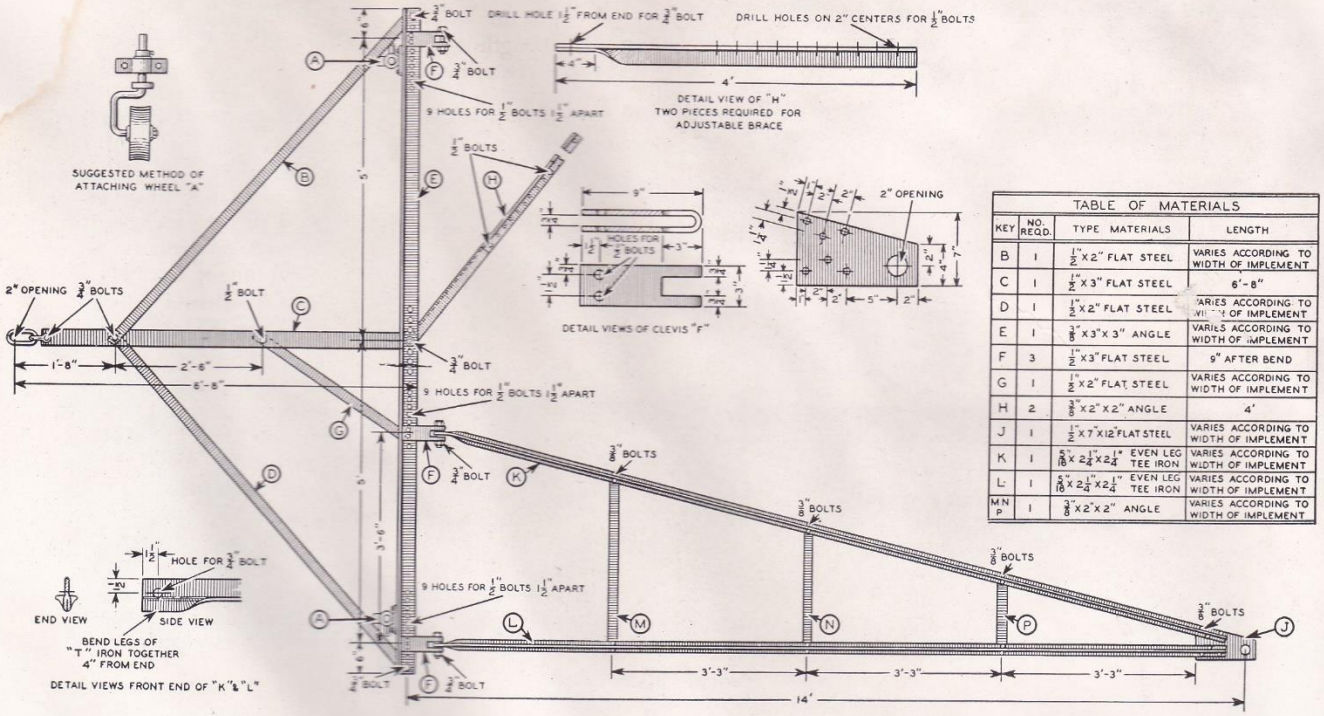

SUGGESTED METHOD OF ATTACHING WHEEL "A"
DETAIL VIEW OF "H" TWO PIECES REQUIRED FOR ADJUSTABLE BRACE
DETAIL VIEWS OF CLEVIS "F"
2" OPENING
DETAIL VIEWS FRONT END OF "K" & "L"
END VIEW
SIDE VIEW
BEND LEGS OF "T" IRON TOGETHER 4" FROM END
9 HOLES FOR ½" BOLTS 1½" APART
DRILL HOLE 1½" FROM END FOR ¾" BOLT
DRILL HOLES ON 2" CENTERS FOR ½" BOLTS
HOLE FOR ¾" BOLT
3'-3"
14'

TABLE OF MATERIALS			
KEY	NO. REQD.	TYPE MATERIALS	LENGTH
B	1	½" X 2" FLAT STEEL	VARIES ACCORDING TO WIDTH OF IMPLEMENT
C	1	½" X 3" FLAT STEEL	6'-8"
D	1	½" X 2" FLAT STEEL	VARIES ACCORDING TO WIDTH OF IMPLEMENT
E	1	⅜" X 3" X 3" ANGLE	VARIES ACCORDING TO WIDTH OF IMPLEMENT
F	3	½" X 3" FLAT STEEL	9" AFTER BEND
G	1	½" X 2" FLAT STEEL	VARIES ACCORDING TO WIDTH OF IMPLEMENT
H	2	⅜" X 2" X 2" ANGLE	4'
J	1	½" X 7" X 12" FLAT STEEL	VARIES ACCORDING TO WIDTH OF IMPLEMENT
K	1	5/16" X 2¼" X 2¼" EVEN LEG TEE IRON	VARIES ACCORDING TO WIDTH OF IMPLEMENT
L	1	5/16" X 2¼" X 2¼" EVEN LEG TEE IRON	VARIES ACCORDING TO WIDTH OF IMPLEMENT
M N P	1	⅜" X 2" X 2" ANGLE	VARIES ACCORDING TO WIDTH OF IMPLEMENT

Figure XVII

from using 10-foot disks of a specific make with the hitch. These dimensions will therefore not fit all implement combinations. Where the assembly must be lengthened or shortened, the holes in plate "J" must be altered from those shown on the detailed view of plate "J" where member "K" is attached. Best results will be obtained if the 2" opening in plate "J" is on the center line of member "L" and clevis "F", at the left end of member "E".

Any type wheels suitable for the purpose may be used with the hitch. Wide wheels of large diameter are best. However, wheels from discarded implements are generally used, regardless of width or diameter. The type wheel used will govern its method of attachments. In some cases the design of the main hitch frame may have to be altered to properly mount the wheels. They should always be mounted ahead of clevis "F". Under some circumstances a wheel may need to be placed at the rear end of the rigid tongue assembly. Some prefer tongue trucks on the implements, in which case wheels would not be mounted on the main hitch frame, excepting on the left corner of the main frame.

Wheels on the main frame will give best results on level land if they are permitted to castor. Some desire to have the hitch height adjustable. The type wheels used and method of mounting them will determine whether or not the hitch height can be adjusted. Some wheels may be more easily attached at the ends of member "E".

The suggested method of mounting the wheels shown in the drawing permits adjusting hitch height by placing a spacer above the stop block, or shoulder on the arm which passes through the hitch frame bracket.

The drawing as shown is for a rigid hitch. No provision has been made for extensions. Should extensions be desired the frame members would have to be stronger than those shown and the design altered to accommodate the change.

CAUTION: Do not try to scale the drawing (on the preceeding page) for dimensions. Consult bill of materials and read notes.

FIGURE XVIII. *Hitch used in pulling two implements.*

THREE-IMPLEMENT HITCH

This drawing is intended as a guide only, for constructing a three-implement hitch.

The widest width implement should be pulled from the center (at "J") and the smaller width implements pulled from the ends (at points "F").

The center line of resistance of a multiple implement combination is generally considered to be in the center of the implement combination. This may vary, however, where an implement of heavier draft is used at one end of the implement combination than on the other, in which case the center of resistance would shift somewhat from the center of the implement combination. The correct line of hitch for the combination would be a straight line extending from the center of resistance of the combination to the tractor drawbar. The line of hitch should be on the center line of the tractor from front to rear. The location of hitch member "C" should be on this line. The dimensions as given on member "C" should be adhered to in order to properly turn tractor without interferring with the main frame of the hitch.

The length of member "E" will vary according to the width of the implement combination. A good general rule to follow is, to use the width of the center implement, plus one-half the width of the two end implements, plus one foot. This may vary with certain implements having a tongue to one side of the center of the implement such as an offset disk harrow, etc. Member "E" should be long enough, however, to allow some adjustment of clevises "F", particularly those at the end of hitch member "E". The dimensions indicated on the hitch are for three 10-foot disks of a specific make.

Clevises "F" may not be adapted to all types of implements, in which case the construction will have to be altered to meet the requirements. Dimensions are not given between these clevises. This distance is governed by the width of the implements to be used with the hitch.

The rigid tongue assembly consists of members "J", "K" and "L", with braces "M", "N" and "P". The length of this rigid tongue assembly will vary according to the length of implements used at the ends of the hitch. The dimensions of the rigid tongue assembly shown on the drawing were figured when using 10-foot disks of a specific make with the hitch. These dimensions will, therefore, not fit all implement combinations. Where the assembly must be lengthened or shortened, the holes in plate "J" must be altered from those shown on the detailed view of plate "J" where member "K" is attached. Provision should be made on member "E" of main frame for adjusting the rigid tongue assembly.

The 2-inch opening in plate "J" should be on the center line of member "L" and clevis "F".

Any type wheels suitable for the purpose may be used on the hitch. Wide wheels of large diameter are best. However wheels from discarded implements are generally used, regardless of width or diameter. The type wheel used will govern its method of attachment. In any case wheels should be large enough to carry the load without materially increasing draft. In some cases the main hitch frame may have to be altered to properly mount the wheels. They should always be mounted ahead of clevis "F". In some cases it may be desirable to use a wheel at the rear of the rigid tongue assembly. Some prefer tongue trucks on the implements rather than wheels on the hitch.

Wheels on the main frame will give the best service on level land if they are permitted to castor. Some desire to have the hitch height adjustable. The type wheels used and method of mounting them will determine whether or not the hitch height can be adjusted. Some wheels may be more easily attached at the end of members "E". The suggested method of mounting the wheels shown in the drawing permits adjusting the hitch height by placing a spacer above the stop lock or shoulder on the arm which passes through the hitch frame bracket.

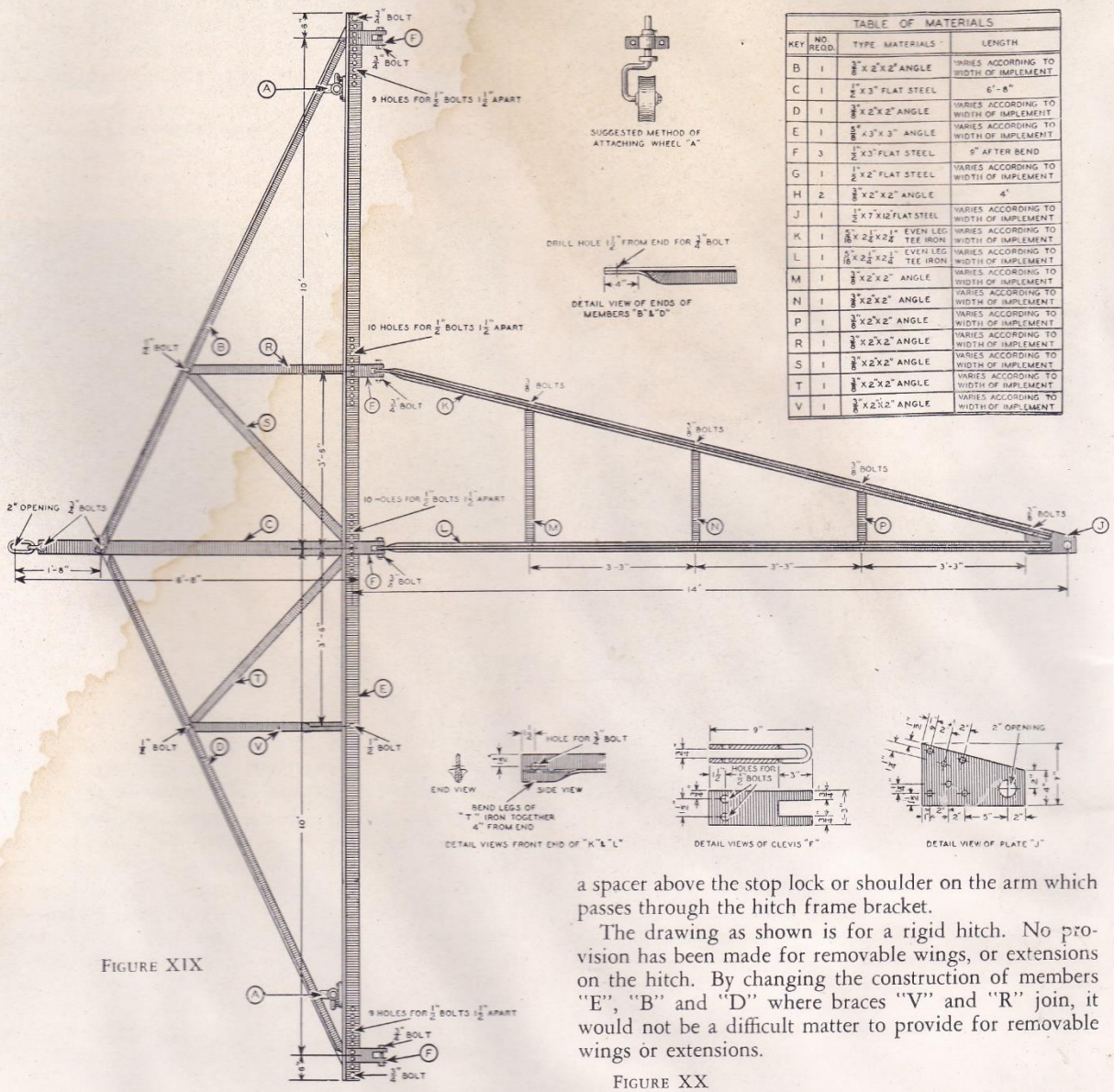
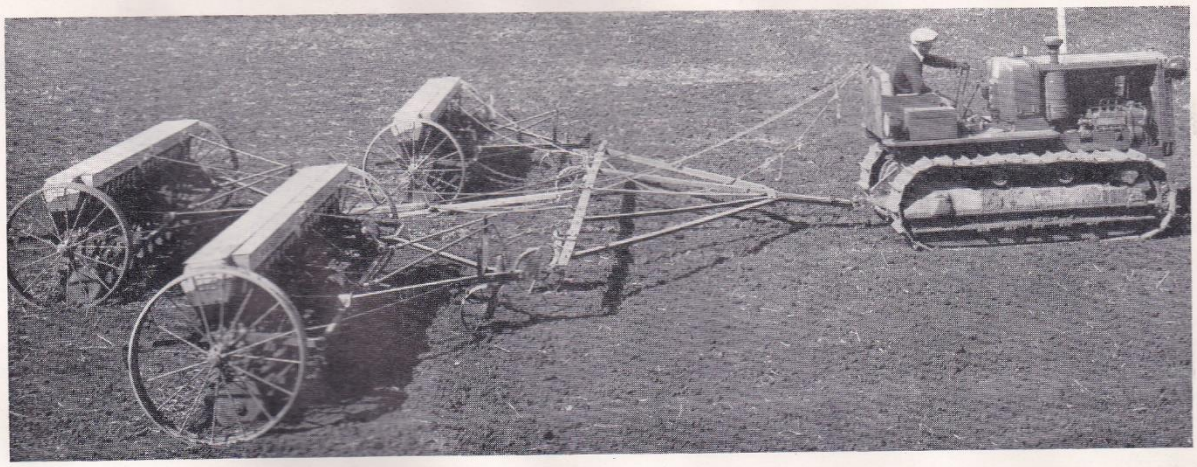

SUGGESTED METHOD OF ATTACHING WHEEL "A"
DRILL HOLE 1½" FROM END FOR ¾" BOLT
4"
DETAIL VIEW OF ENDS OF MEMBERS "B" & "D"
9 HOLES FOR ½" BOLTS 1½" APART
10 HOLES FOR ½" BOLTS 1½" APART
2" OPENING
1'-8"
6'-8"
14'
3'-3"
HOLE FOR ¾" BOLT
END VIEW
SIDE VIEW
BEND LEGS OF "T" IRON TOGETHER 4" FROM END
DETAIL VIEWS FRONT END OF "K" & "L"
HOLES FOR ½" BOLTS
DETAIL VIEWS OF CLEVIS "F"
DETAIL VIEW OF PLATE "J"

TABLE OF MATERIALS			
KEY	NO. REQ'D.	TYPE MATERIALS	LENGTH
B	1	⅜" X 2" X 2" ANGLE	VARIES ACCORDING TO WIDTH OF IMPLEMENT
C	1	½" X 3" FLAT STEEL	6'-8"
D	1	⅜" X 2" X 2" ANGLE	VARIES ACCORDING TO WIDTH OF IMPLEMENT
E	1	⅝" X 3" X 3" ANGLE	VARIES ACCORDING TO WIDTH OF IMPLEMENT
F	3	½" X 3" FLAT STEEL	9" AFTER BEND
G	1	½" X 2" FLAT STEEL	VARIES ACCORDING TO WIDTH OF IMPLEMENT
H	2	⅜" X 2" X 2" ANGLE	4'
J	1	½" X 7" X 12" FLAT STEEL	VARIES ACCORDING TO WIDTH OF IMPLEMENT
K	1	5/16" X 2½" X 2½" EVEN LEG TEE IRON	VARIES ACCORDING TO WIDTH OF IMPLEMENT
L	1	5/16" X 2½" X 2½" EVEN LEG TEE IRON	VARIES ACCORDING TO WIDTH OF IMPLEMENT
M	1	⅜" X 2" X 2" ANGLE	VARIES ACCORDING TO WIDTH OF IMPLEMENT
N	1	⅜" X 2" X 2" ANGLE	VARIES ACCORDING TO WIDTH OF IMPLEMENT
P	1	⅜" X 2" X 2" ANGLE	VARIES ACCORDING TO WIDTH OF IMPLEMENT
R	1	⅜" X 2" X 2" ANGLE	VARIES ACCORDING TO WIDTH OF IMPLEMENT
S	1	⅜" X 2" X 2" ANGLE	VARIES ACCORDING TO WIDTH OF IMPLEMENT
T	1	⅜" X 2" X 2" ANGLE	VARIES ACCORDING TO WIDTH OF IMPLEMENT
V	1	⅜" X 2" X 2" ANGLE	VARIES ACCORDING TO WIDTH OF IMPLEMENT

FIGURE XIX

The drawing as shown is for a rigid hitch. No provision has been made for removable wings, or extensions on the hitch. By changing the construction of members "E", "B" and "D" where braces "V" and "R" join, it would not be a difficult matter to provide for removable wings or extensions.

FIGURE XX



Adjustable Multiple Implement Hitch

For Two or Three Implements

The hitch shown below provides a maximum distance of 12 feet between implement couplings (without extensions). Hitch height is adjustable from 12 to 24 inches. Horizontal adjustment of implement couplings enables hitching implements of various kinds and non-uniform width.

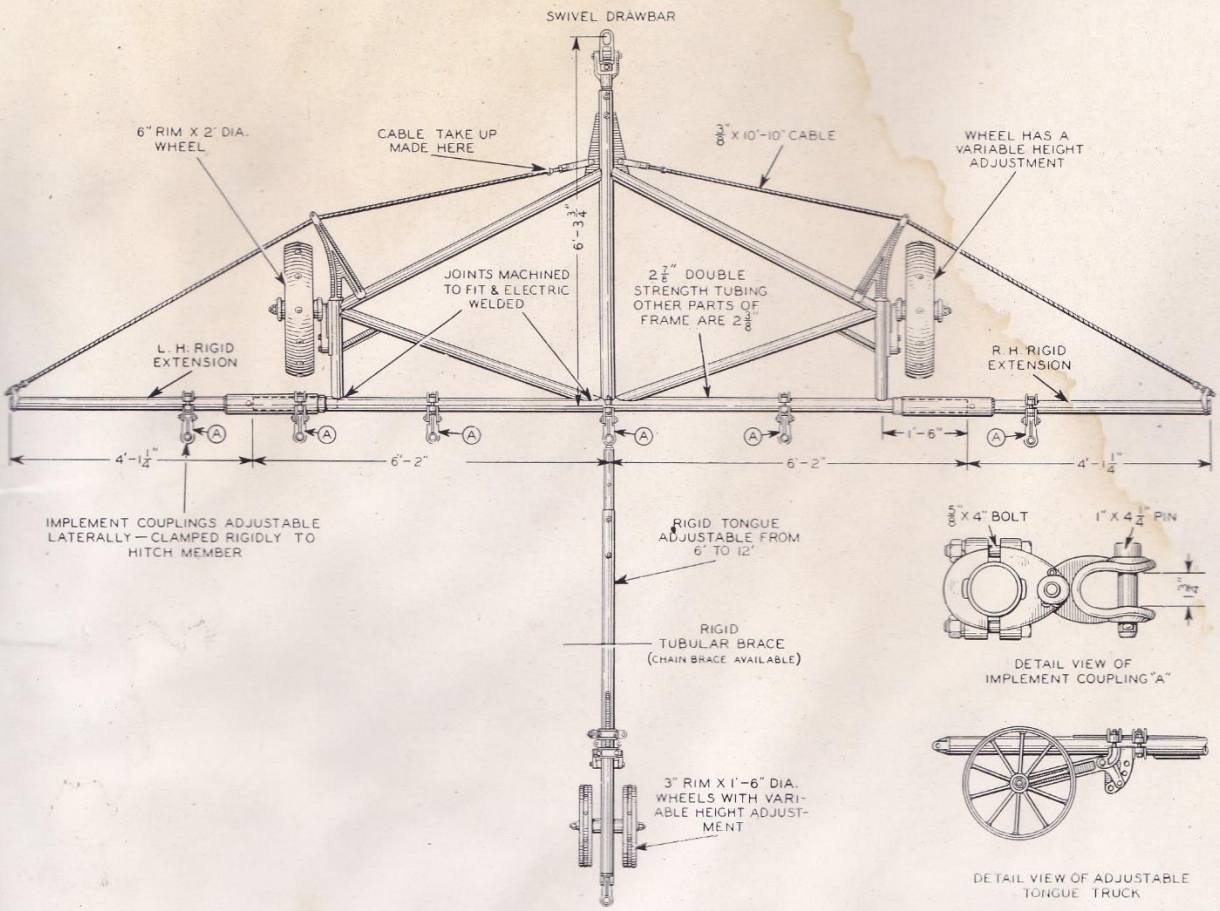

SWIVEL DRAWBAR
6" RIM X 2" DIA. WHEEL
CABLE TAKE UP MADE HERE
3/8" X 10'-10" CABLE
WHEEL HAS A VARIABLE HEIGHT ADJUSTMENT
6'-3 3/4"
JOINTS MACHINED TO FIT & ELECTRIC WELDED
2 7/8" DOUBLE STRENGTH TUBING OTHER PARTS OF FRAME ARE 2 3/8"
L. H. RIGID EXTENSION
R. H. RIGID EXTENSION
4'-1 1/4"
6'-2"
6'-2"
1'-6"
4'-1 1/4"
IMPLEMENT COUPLINGS ADJUSTABLE LATERALLY — CLAMPED RIGIDLY TO HITCH MEMBER
RIGID TONGUE ADJUSTABLE FROM 6' TO 12'
RIGID TUBULAR BRACE (CHAIN BRACE AVAILABLE)
3" RIM X 1'-6" DIA. WHEELS WITH VARIABLE HEIGHT ADJUSTMENT
5/8" X 4" BOLT
1" X 4 1/2" PIN
DETAIL VIEW OF IMPLEMENT COUPLING "A"
DETAIL VIEW OF ADJUSTABLE TONGUE TRUCK

FIGURE XXI

Light Running, Adjustability Throughout, Flexible Laterally, Rigidity From Front to Rear

— NOTES —

1. This drawing is intended as a guide only in building a hitch. Do not try to scale drawing for dimensions.

2. This drawing shows the hitch with rigid extensions and tongue truck with adjustable twin wheels and one tubular brace.

3. Center to center of main wheels 10'-7".

4. Each rigid hitch extension adds 4' to hitch width.

5. Most any good farmer can make this hitch out of used materials.

Adjustable Multiple Implement Hitch

For Three, Four, Five or Six Implements

Pulls three 12-foot duck-foot cultivators—or four grain drills totalling 44 feet in width—or a squadron of five 10-foot disc harrows—or six 8-foot deep furrow drills.

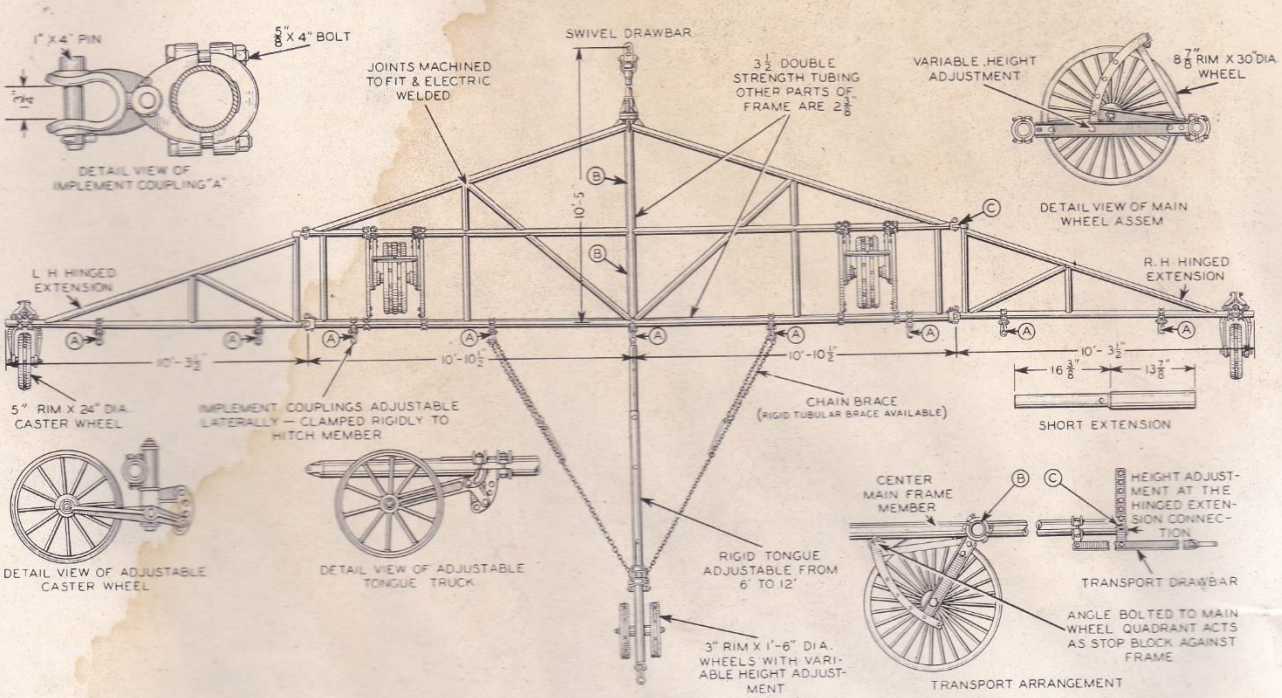

1" X 4" PIN
5/8" X 4" BOLT
DETAIL VIEW OF IMPLEMENT COUPLING "A"
JOINTS MACHINED TO FIT & ELECTRIC WELDED
SWIVEL DRAWBAR
3½" DOUBLE STRENGTH TUBING OTHER PARTS OF FRAME ARE 2⅜"
VARIABLE HEIGHT ADJUSTMENT
8 7/8" RIM X 30" DIA. WHEEL
DETAIL VIEW OF MAIN WHEEL ASSEM
L H HINGED EXTENSION
R H HINGED EXTENSION
10'-5"
10'-3½"
10'-10½"
10'-10½"
10'-3½"
16 3/8"
13 3/8"
5" RIM X 24" DIA. CASTER WHEEL
IMPLEMENT COUPLINGS ADJUSTABLE LATERALLY — CLAMPED RIGIDLY TO HITCH MEMBER
CHAIN BRACE (RIGID TUBULAR BRACE AVAILABLE)
SHORT EXTENSION
DETAIL VIEW OF ADJUSTABLE CASTER WHEEL
DETAIL VIEW OF ADJUSTABLE TONGUE TRUCK
CENTER MAIN FRAME MEMBER
HEIGHT ADJUSTMENT AT THE HINGED EXTENSION CONNECTION
TRANSPORT DRAWBAR
RIGID TONGUE ADJUSTABLE FROM 6' TO 12'
ANGLE BOLTED TO MAIN WHEEL QUADRANT ACTS AS STOP BLOCK AGAINST FRAME
3" RIM X 1'-6" DIA. WHEELS WITH VARIABLE HEIGHT ADJUSTMENT
TRANSPORT ARRANGEMENT

FIGURE XXII

Heavy-Duty — Durable

Can be made of used steel tubing or pipe—electric welded.

Light Running

Hitch heights are adjustable to reduce downward pressure on wheels.

Widely Adjustable

Wheels are adjustable laterally to fit row crop spacings.

Flexible

Hitch pivots up and down, minimizing strains when working rough or hilly ground.

Convenient to Transport

Arranged for transportation this hitch has a width of less than 7½ feet.

Accurate Turning

Designed to hold implements in accurate position on turns.

— NOTES —

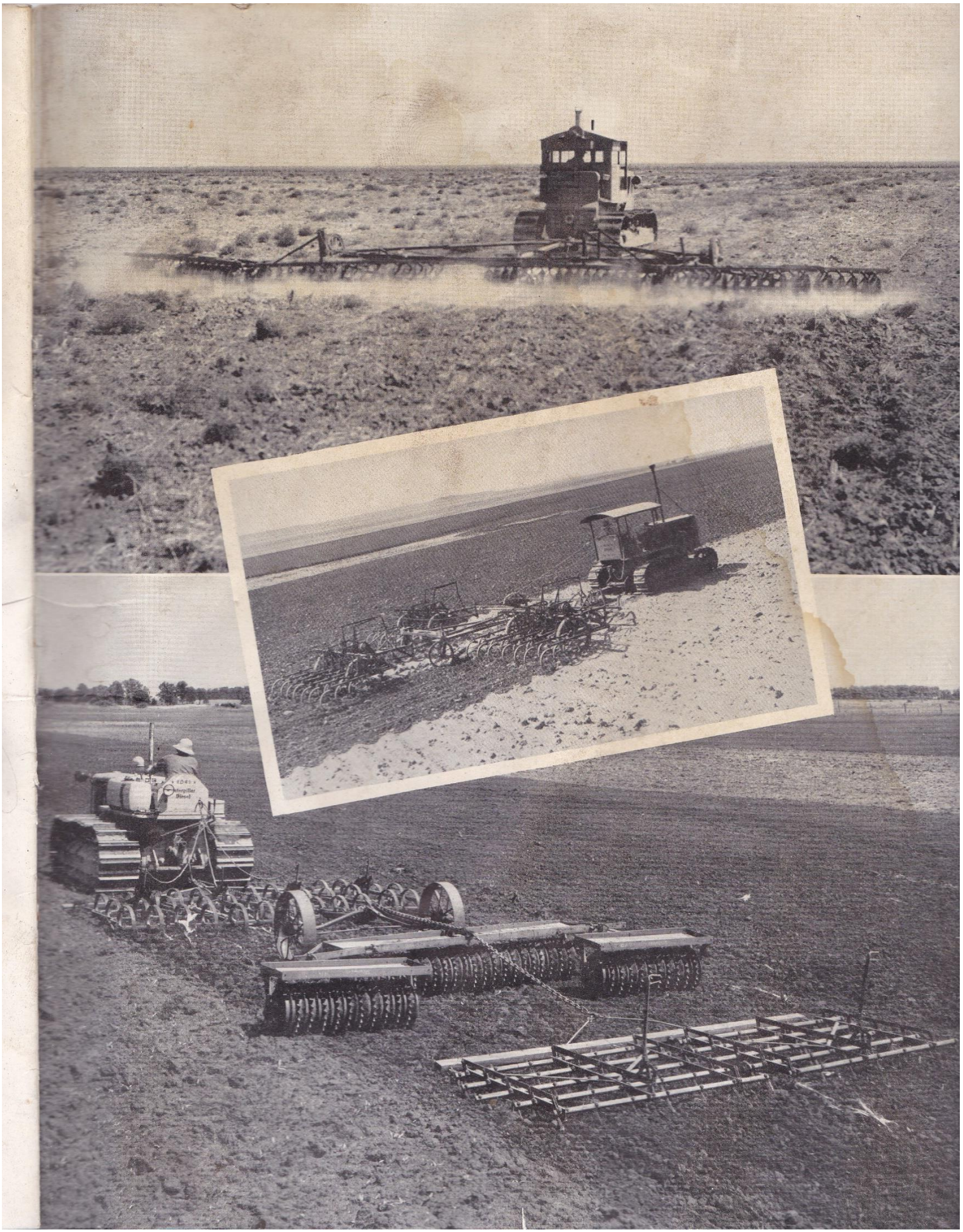
1. This drawing is intended as a guide only in building this hitch. Do not try to scale drawing for dimensions.

2. Center to center of main frame wheels adjustable from 13'-4" to 16'-10".

3. Hitch height adjustable from 12 to 24 inches.

4. Each hinged extension is 10'-3½" wide. Castor wheel is adjustable laterally.

5. Most any good farmer can make this hitch out of used materials.



"Who sells and services 'Caterpillar' Diesel Power?"

Each spot on the above map represents a "Caterpillar" dealer's place of business

He owns and has the "say-so" in his business. He is in the machinery business because he likes it better than any other. Likewise, he established himself in your locality because he likes it and wants to make good there.

He is mainly selling opportunities — to produce food, for example, with less expense and human energy. He's merchandising proved ways to increase wealth and add satisfaction to living.

He is soundly established and has qualified to high standards of skill and integrity — before Caterpillar Tractor Co. approved him as a dealer.

As a "Caterpillar" dealer, he has up-to-date facilities to back the low-cost performance and long machine life for which "Caterpillar" equipment is noted.

Your "Caterpillar" Dealer is a good man to know!

CATERPILLAR TRACTOR CO. PEORIA, ILL.

BUNTING TRACTOR CO., Inc.
Boise, Twin Falls, Burley, Carey, Buhl
Gooding, Fairfield, and Mountain Home, Idaho

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